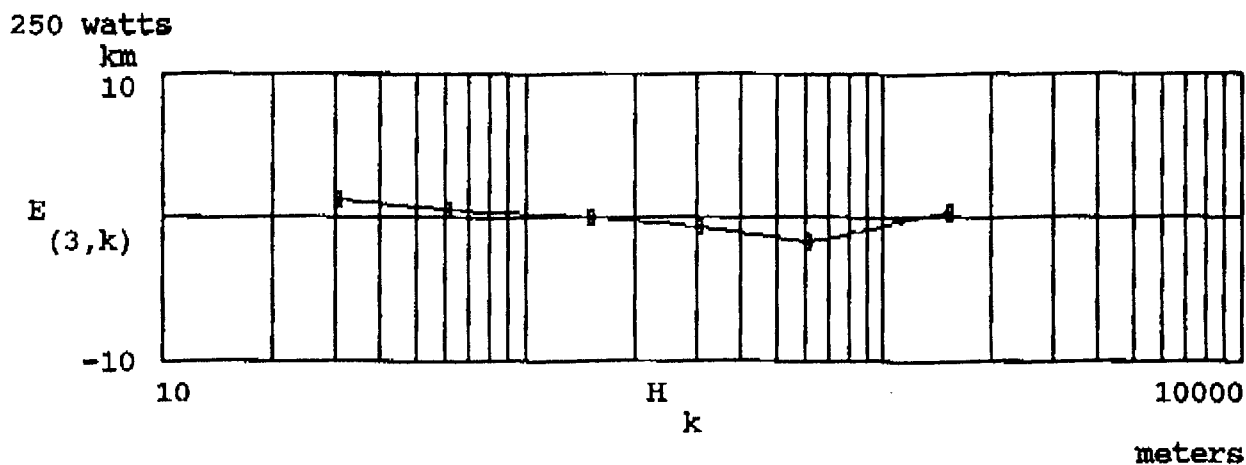
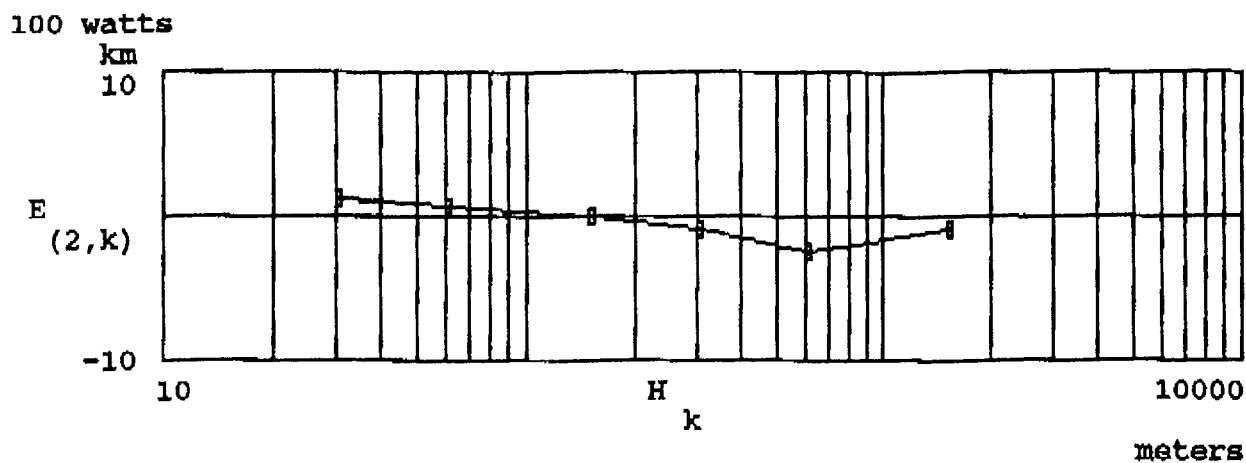
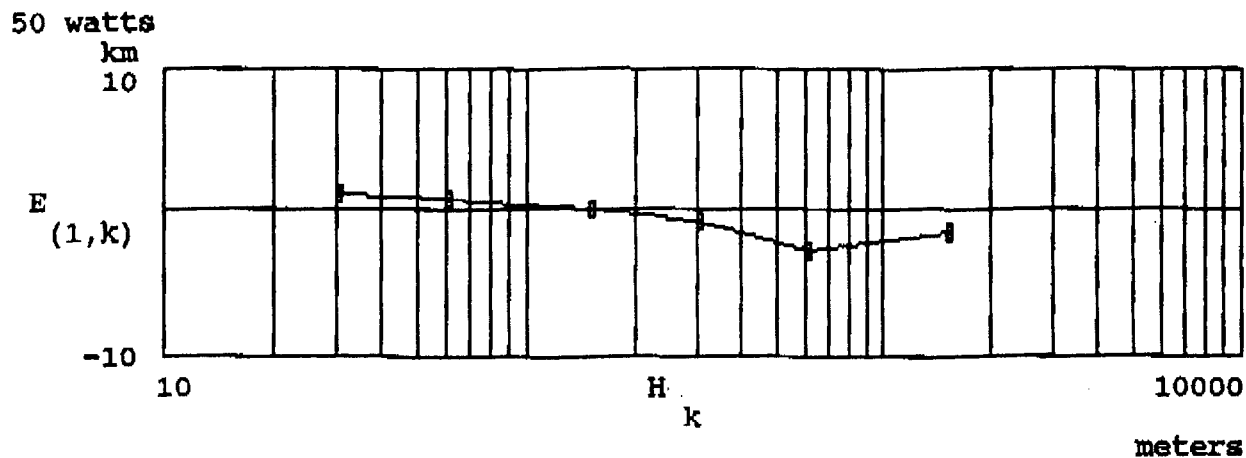
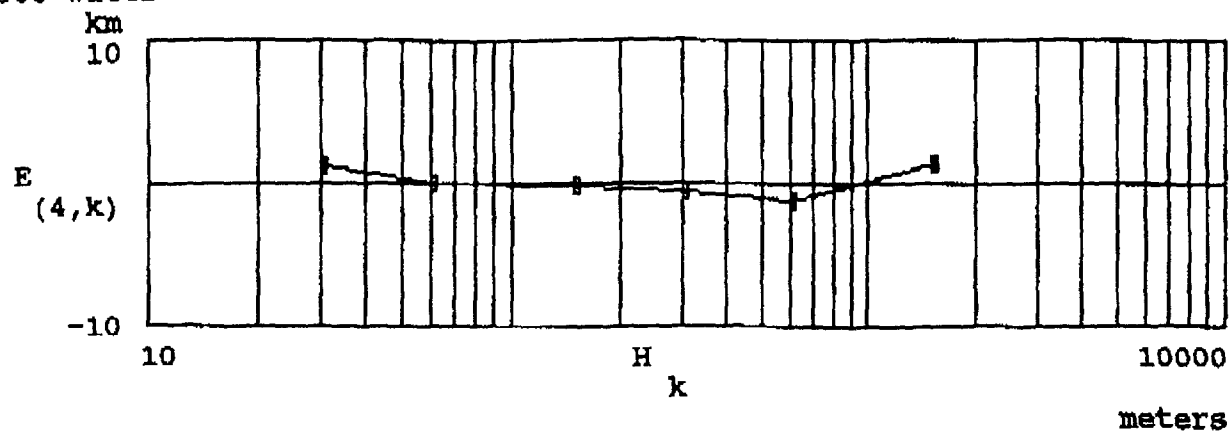


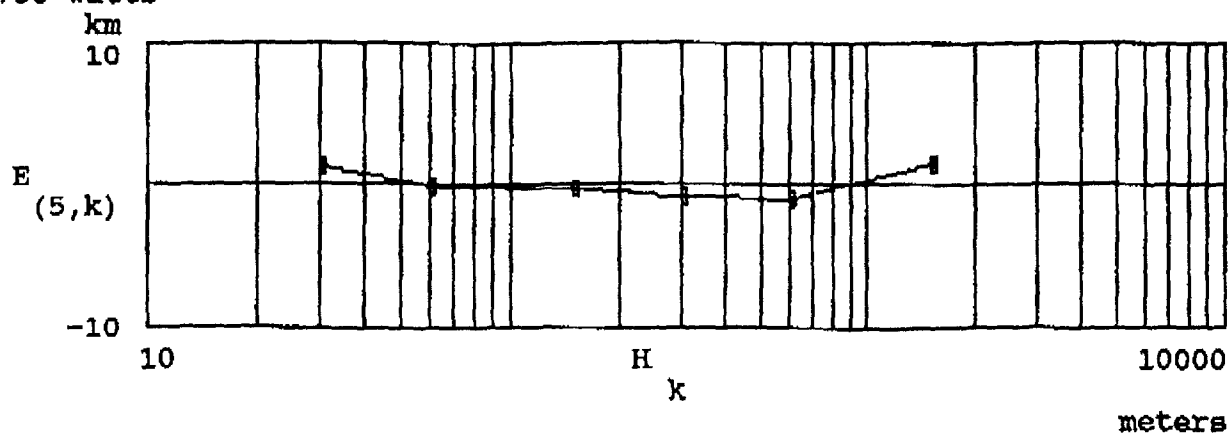
Figure C4. PLOTS of 'Formula Distance' - 'Carey Service Contour Distance'
as a function of height for various ERP's



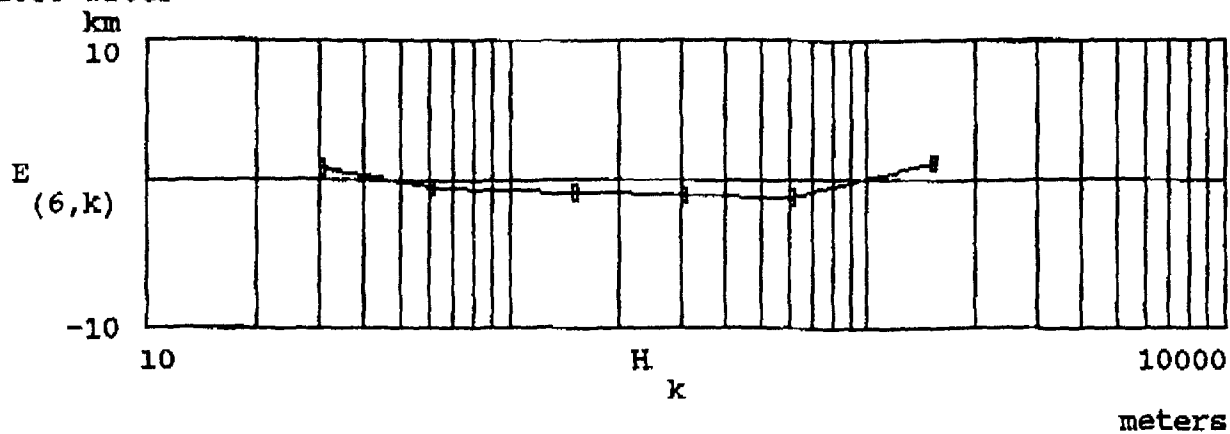
500 watts



750 watts



1000 watts



1400 watts

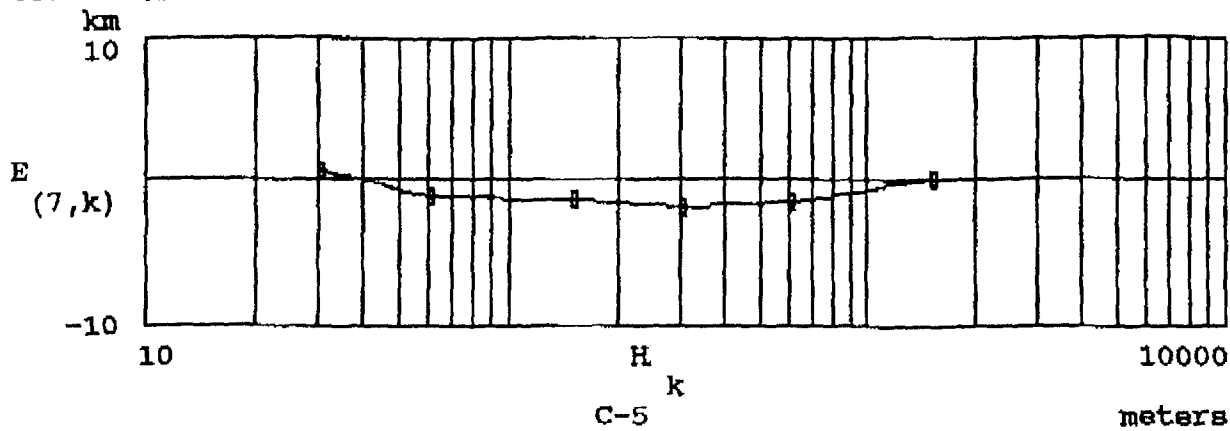


Figure C5. Basic VHF One-Way or Two-Way Service Contour Data.

Elevations Used: 100, 200, 500, 1000, 2000, 5000 ft.
30.5, 61.0 152.4, 304.8, 609.6, 1524 meters

ERP's Used: 50, 100, 250, 500, 750, 1000, 1400 watts

Matrix of Carey 37 dBu Service Contour Distances (km):

Elevations-->							
VS =	14.001	18.668	27.037	35.245	46.027	57.454	E R P ↓
	16.093	21.565	30.899	40.073	51.499	63.408	
	19.473	26.071	36.693	47.154	59.385	71.777	
	22.37	30.095	41.682	52.948	65.822	78.053	
	24.14	32.509	44.74	56.649	69.524	81.916	
	25.75	34.44	47.315	59.224	72.26	84.652	
	27.52	36.854	50.051	62.443	75.317	88.031	

Error Matrix for points in above matrix:

'Formula calculated distance' - 'Carey Service Contour Distance' (km):

E =	1.139	0.813	0.029	-0.785	-2.727	-1.428
	1.271	0.759	0.057	-0.765	-2.356	-0.737
	1.277	0.56	0.114	-0.613	-1.62	0.432
	1.256	0.158	-0.03	-0.499	-1.148	1.476
	1.254	-0.061	-0.21	-0.756	-0.916	1.559
	0.909	-0.446	-0.803	-1.008	-1.069	1.254
	0.587	-1.126	-1.389	-1.783	-1.524	0.069

A row by row plot of these errors is presented in Figure C4.

Standard Deviation of Above Errors: $\sigma = 7.164$ km

Error Matrix -- FCC Proposed Equation:

'FCC equation distance' - 'Carey Service Contour Distance' (km):

EFCC =	-0.38	-0.695	-1.106	-1.029	-0.879	7.682
	-0.337	-0.775	-0.906	-0.496	0.723	11.933
	-0.374	-0.87	-0.335	0.821	3.918	19.55
	-0.278	-0.945	0.373	2.544	7.4	27.584
	-0.085	-0.768	1.053	3.775	10.206	33.11
	-0.196	-0.722	1.33	4.963	12.435	37.538
	-0.096	-0.668	2.155	6.444	15.578	43.104

Standard Deviation of errors for FCC Proposed Equation:

$\sigma_{FCC} = 79.901$ km

Figure C6. Proposed VHF One-Way or Two-Way Mobile Interference Formula.

The following formula has been developed for calculating VHF One-Way or Two-way Mobile Interference Contour Distances:

$$d = 10.587 \times h^{.21} \times p^{(0.18 + 0.0000135 \times h)} \quad h < 150 \text{ meters}$$

$$d = 10.068 \times h^{.22} \times p^{(0.18 + 0.0000135 \times h)} \quad h \geq 150 \text{ meters}$$

where

d is the radial distance in kilometers
h is the radial antenna HAAT in meters
p is the radial ERP in watts

Figure C7 contains a series of plots of the proposed formula.

Figure C8 contains a series of plots of the Carey Interference Contour (without the 3 dB/Octave height correction).

Figure C9 contains a series of plots of the Carey Interference Contour (with the 3 dB/Octave height correction).

Figure C10 contains a series of plots of the Carey Interference Contour (50/50 weighted average of the Carey Interf Contour w & w/o the 3 dB/Octave height correction).

Figure C11 contains a series of plots of the differences between the proposed formula results and the Carey Interference Contour for height up to 500'.

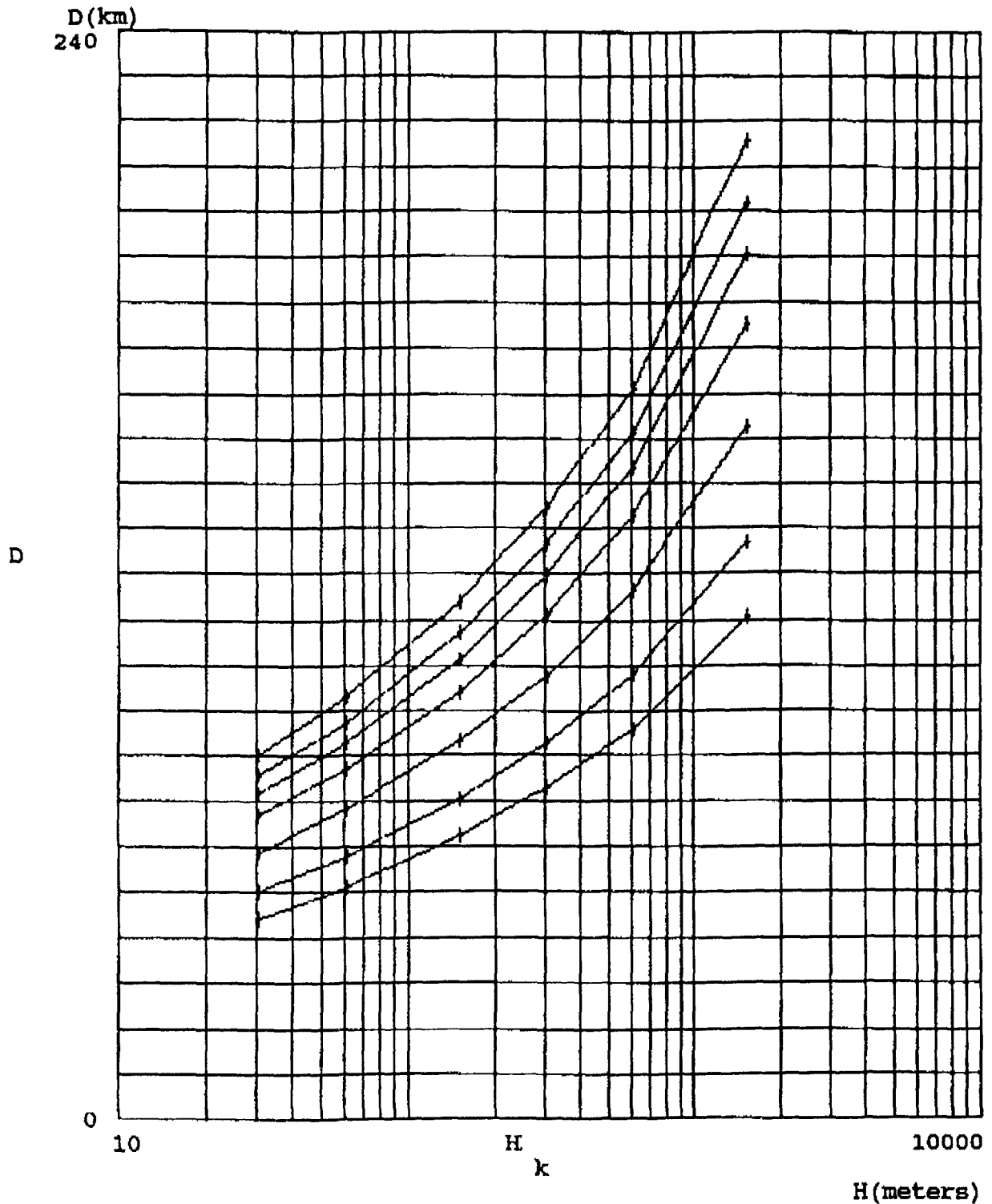
Figure C12 contains a series of plots that show the FCC proposed equation. These plots are included to illustrate the discontinuity contained in the FCC proposed equations. The equation used for these calculations was:

$$d = 8.577 \times h^{0.24} \times p^{0.19} \quad h < 150 \text{ meters}$$

$$d = 12.306 \times h^{0.23} \times p^{0.14} \quad h \geq 150 \text{ meters}$$

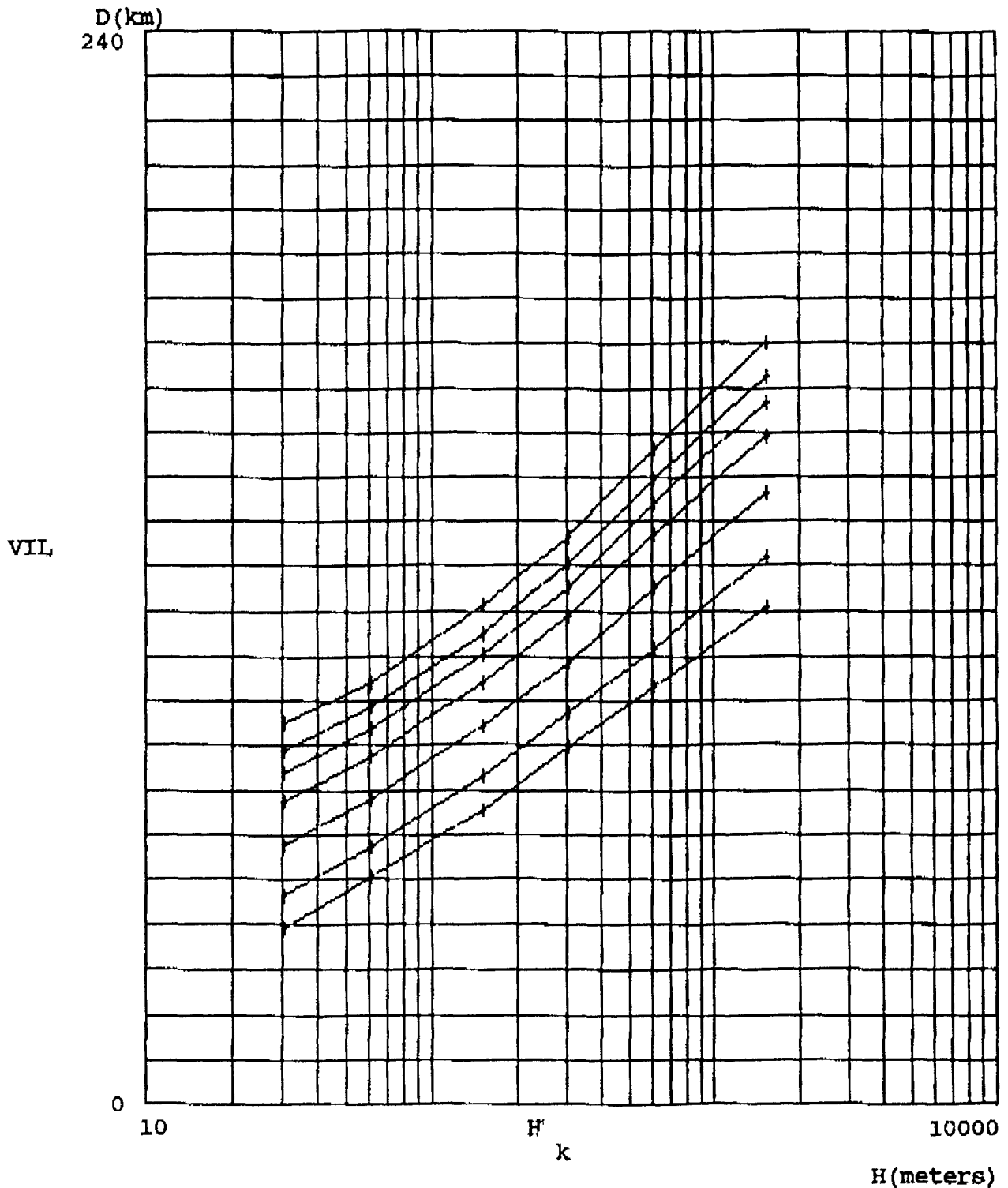
Figure C13 contains listings of the Carey Interference Contour data, errors, and relevant results.

Figure C7. VHF MOBILE INTERFERENCE CONTOUR DISTANCES



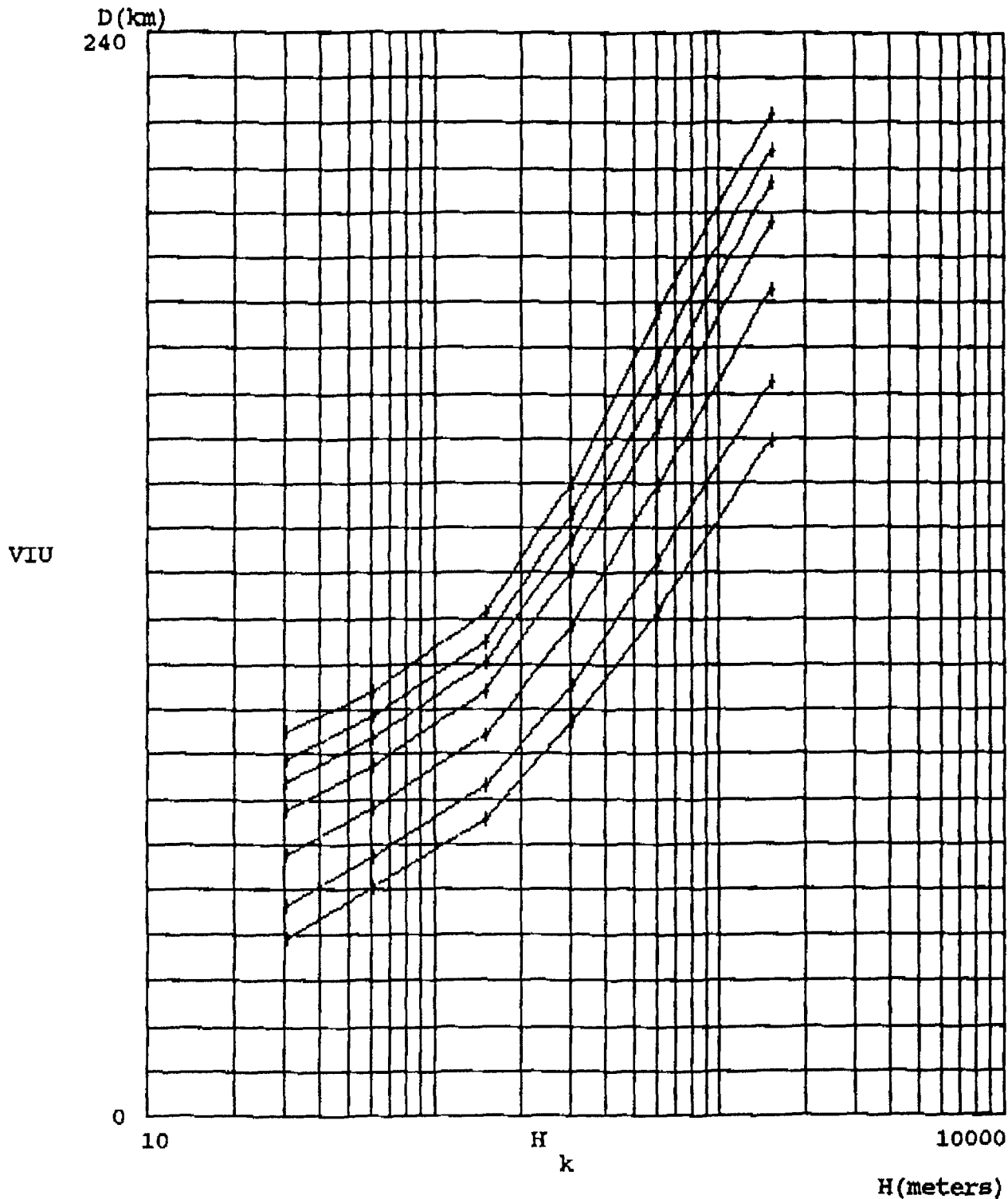
VHF One-Way or Two-Way Mobile Interference Contour Distances
as calculated from proposed formula as a function of Height
for ERP's of 50, 100, 250, 500, 750, 1000, 1400 watts

Figure C8. VHF MOBILE CAREY INTERFERENCE CONTOUR DISTANCES



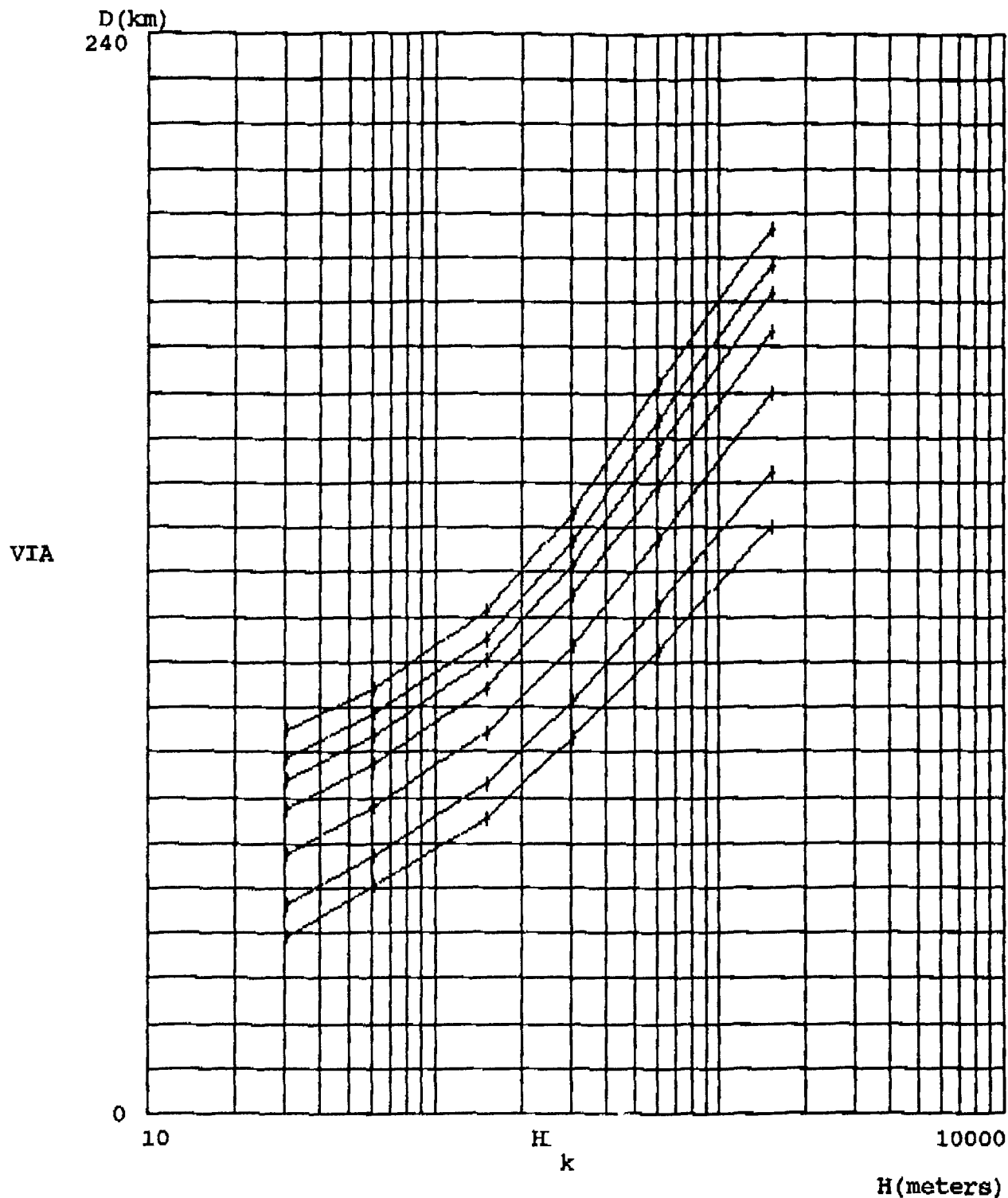
VHF One-Way or Two-Way Mobile Interference Contour Distances
(without additional 3 dB/octave height correction
above 500') as a function of Height for ERP's of
50, 100, 250, 500, 750, 1000, 1400 watts

Figure C9. VHF MOBILE CAREY INTERFERENCE CONTOUR DISTANCES



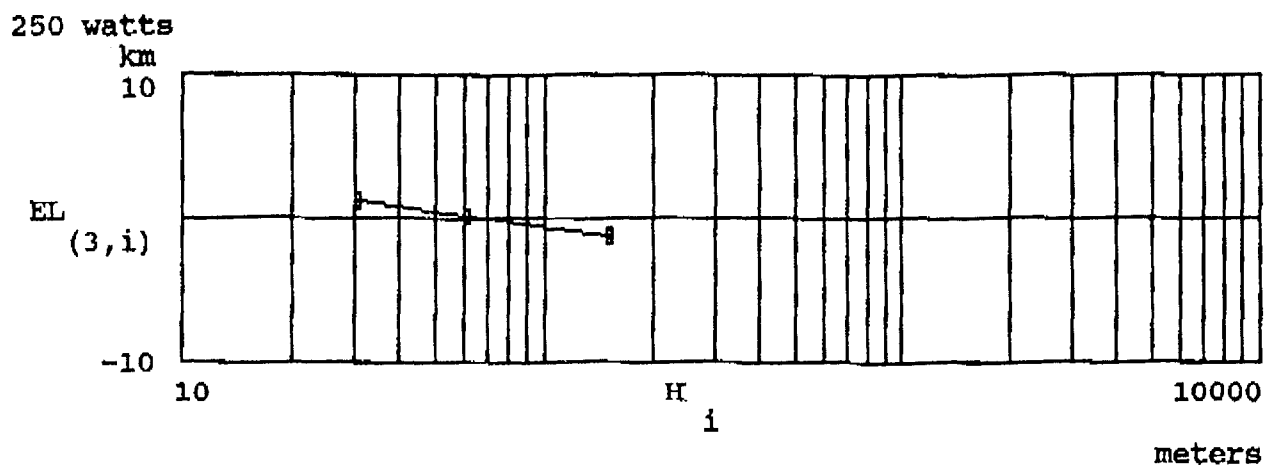
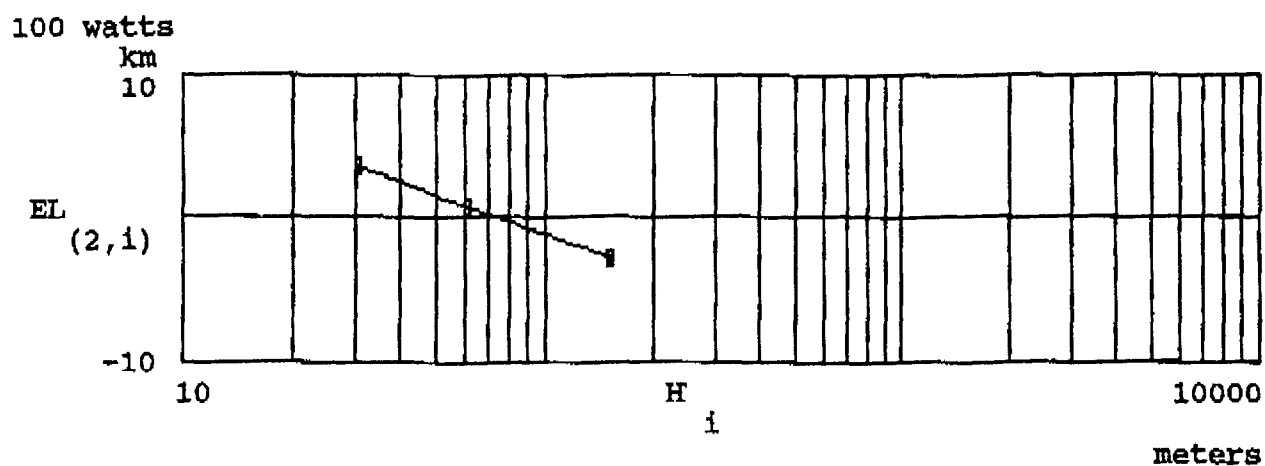
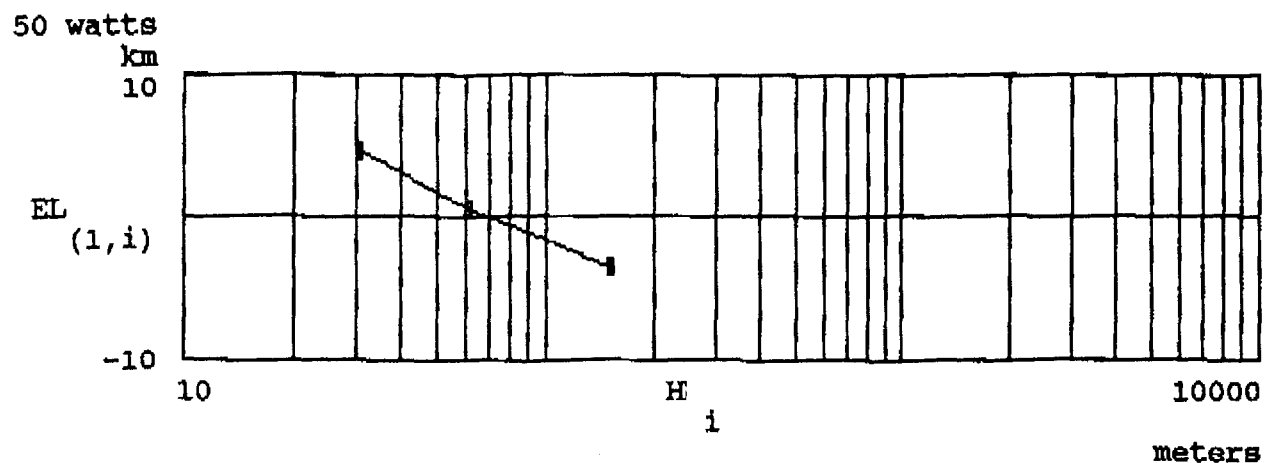
VHF One-Way or Two-Way Mobile Interference Contour Distances
(with additional 3 dB/octave height correction
above 500') as a function of Height for ERP's of
50, 100, 250, 500, 750, 1000, 1400 watts

Figure C10. VHF MOBILE CAREY INTERFERENCE CONTOUR DISTANCES



VHF One-Way or Two-Way Mobile Interference Contour Distances (50/50 weighted average w & w/o additional 3 dB/octave height correction above 500') as a function of Height for ERP's of 50, 100, 250, 500, 750, 1000, 1400 watts.

Figure C11. PLOTS of 'Formula Distance' - 'Carey Interf. Contour Distance' as a function of height up to 500' for various ERP's.



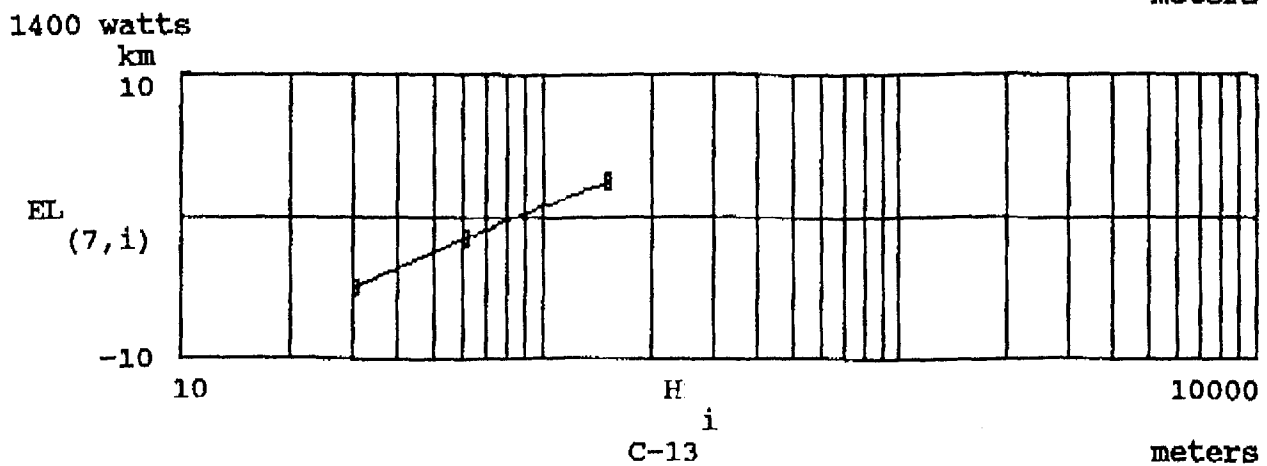
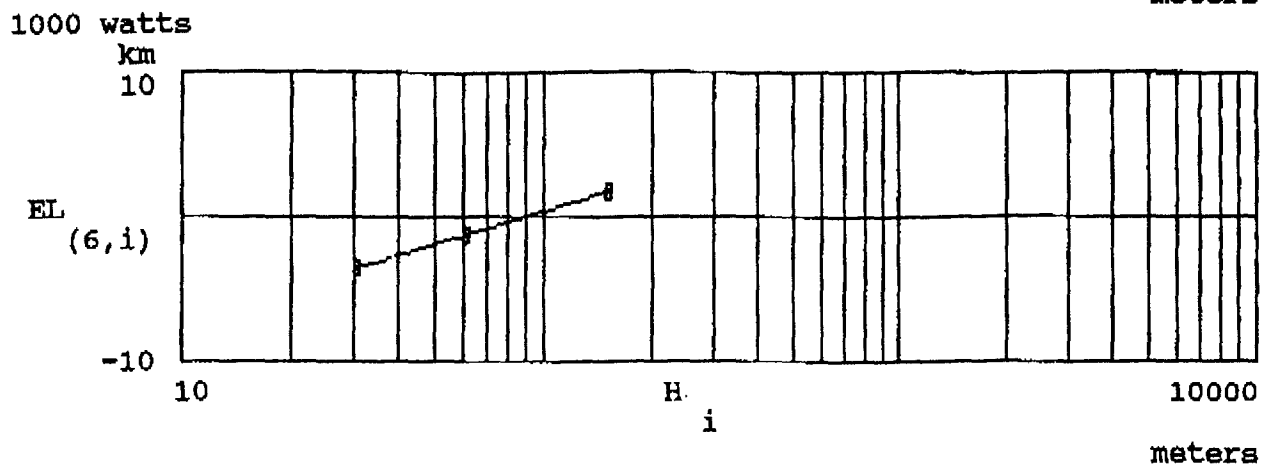
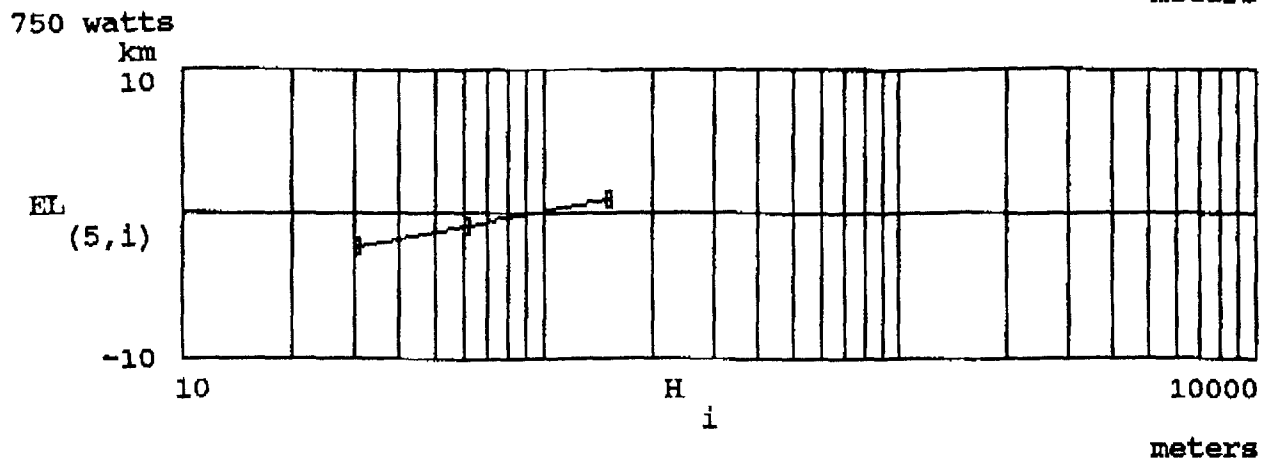
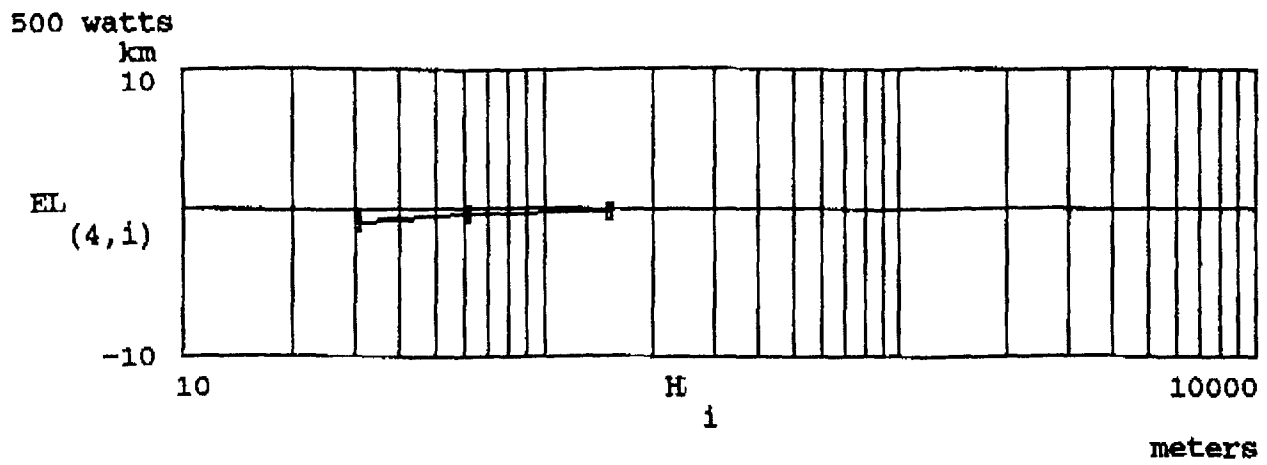


Figure C12(a). Plot of VHF Interference Distance From FCC Equation

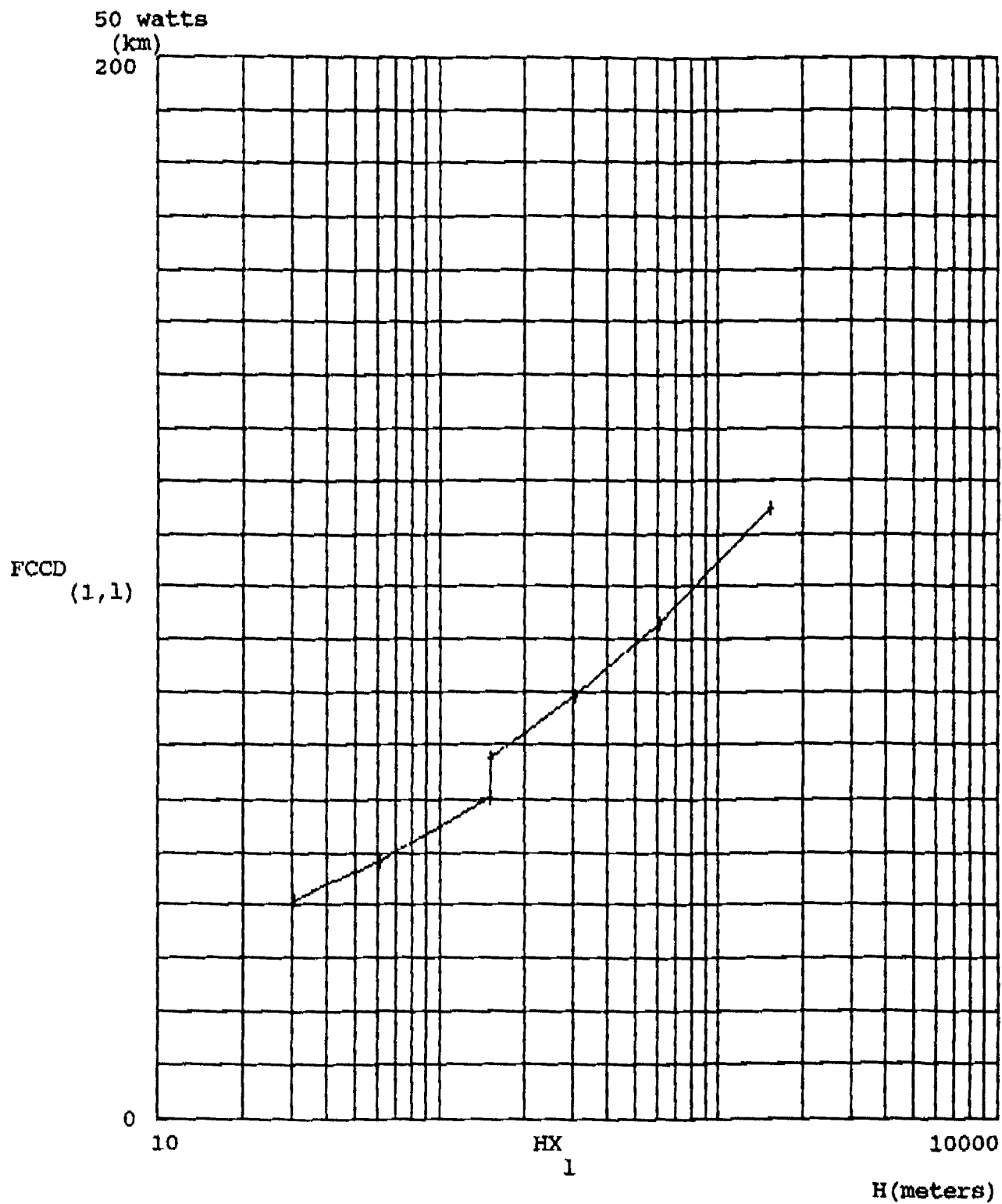


Figure C12(b). Plot of VHF Interference Distance From FCC Equation

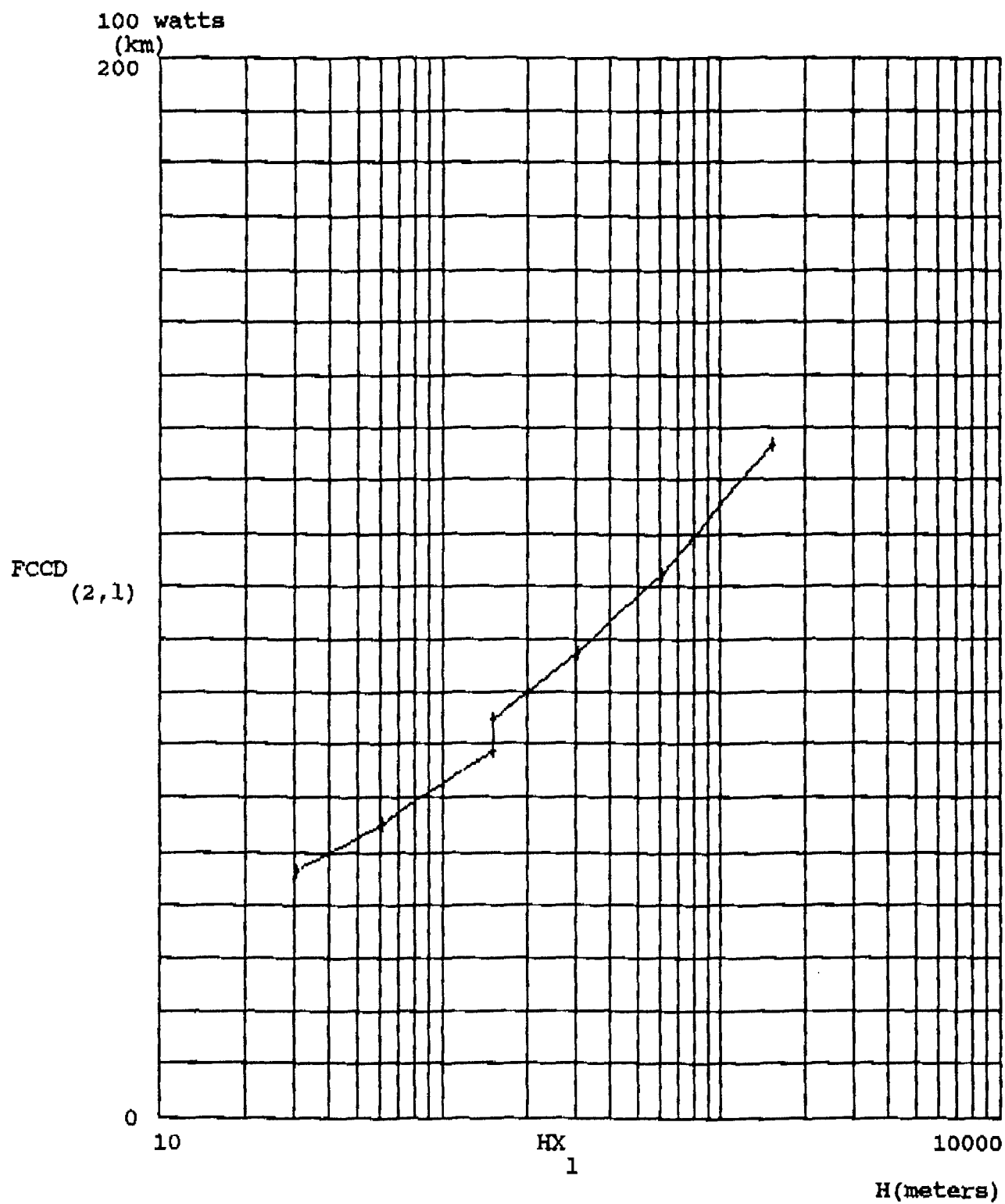


Figure C12(c). Plot of VHF Interference Distance From FCC Equation

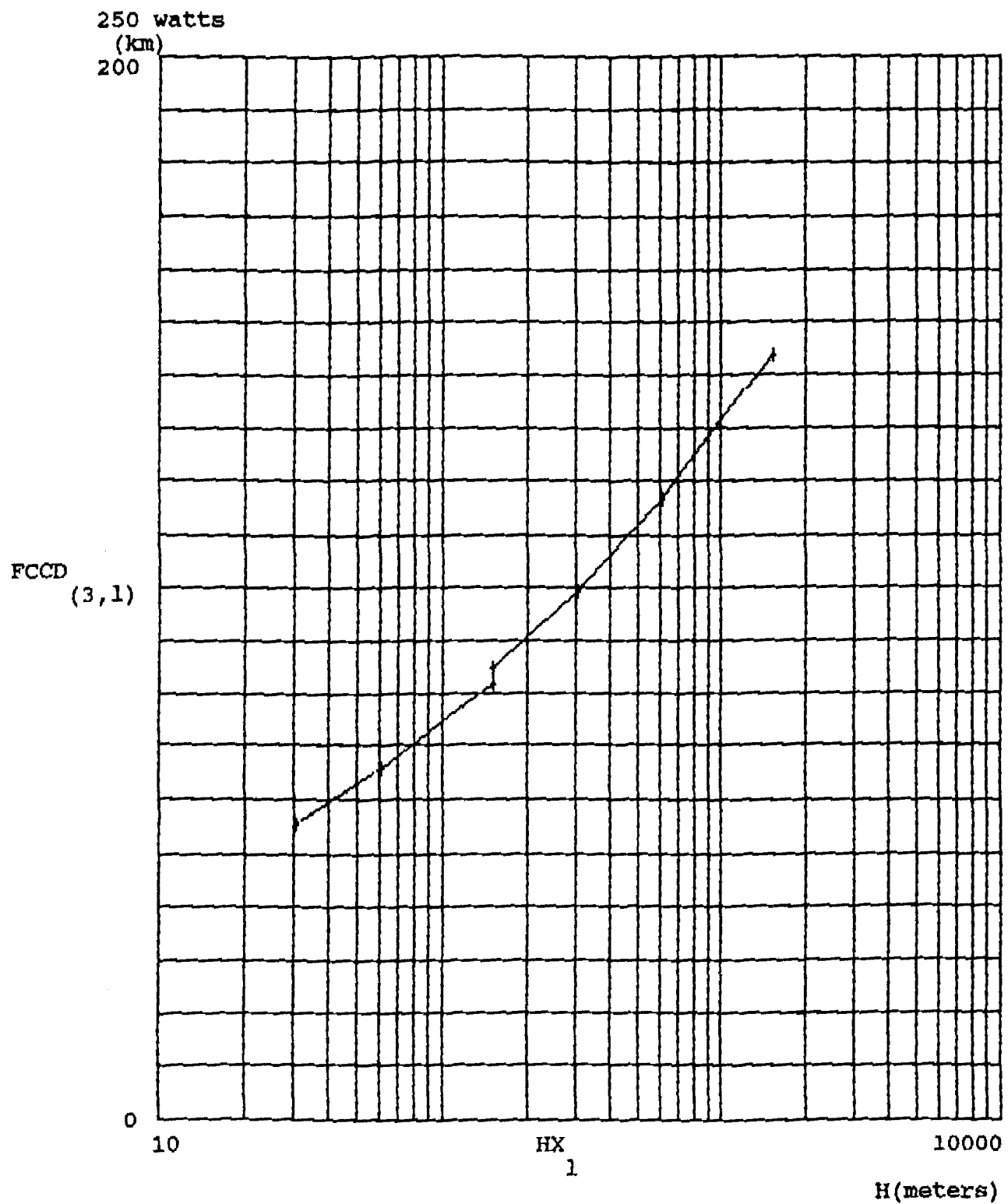


Figure C12(d). Plot of VHF Interference Distance From FCC Equation

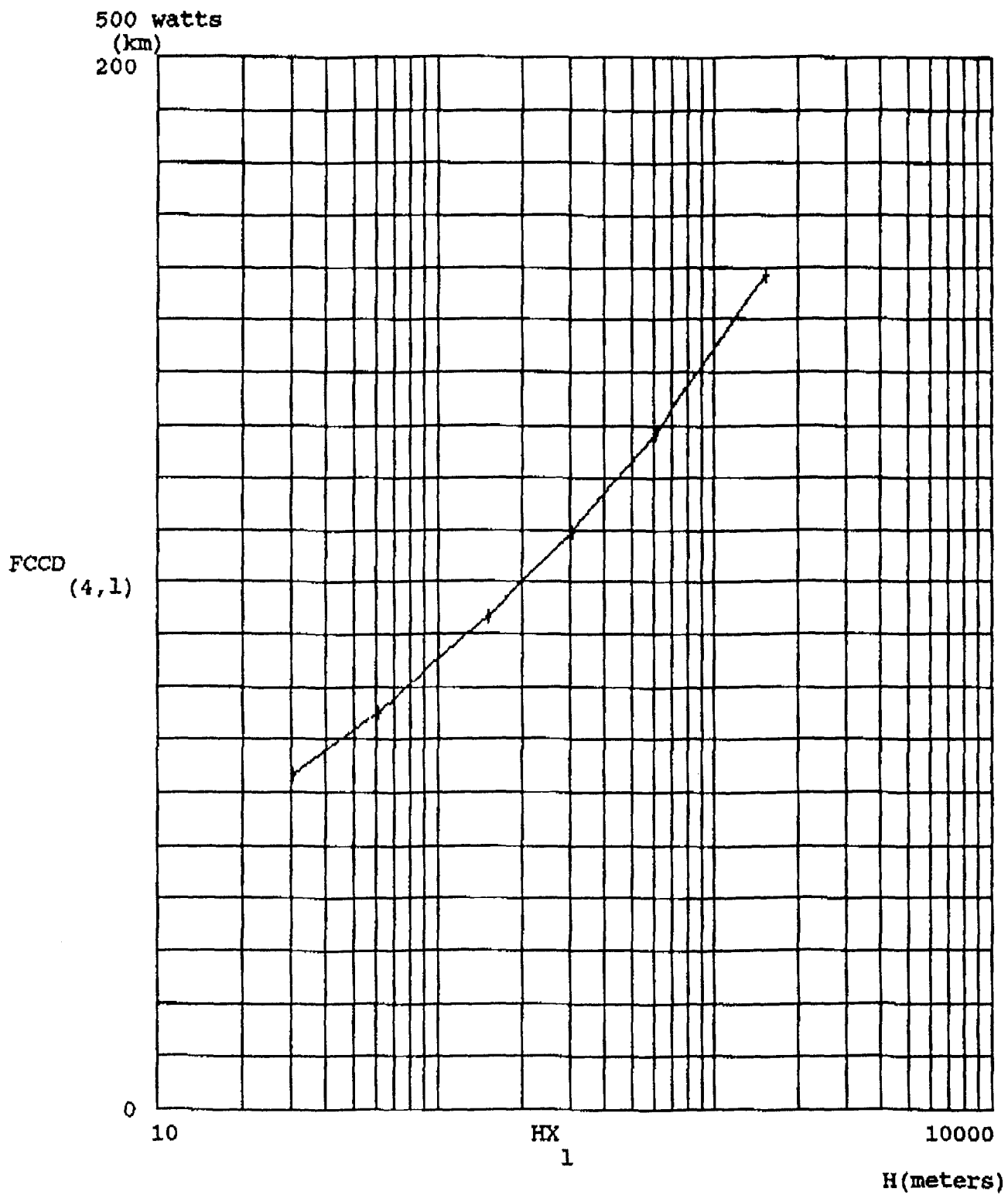


Figure C12(e). Plot of VHF Interference Distance From FCC Equation

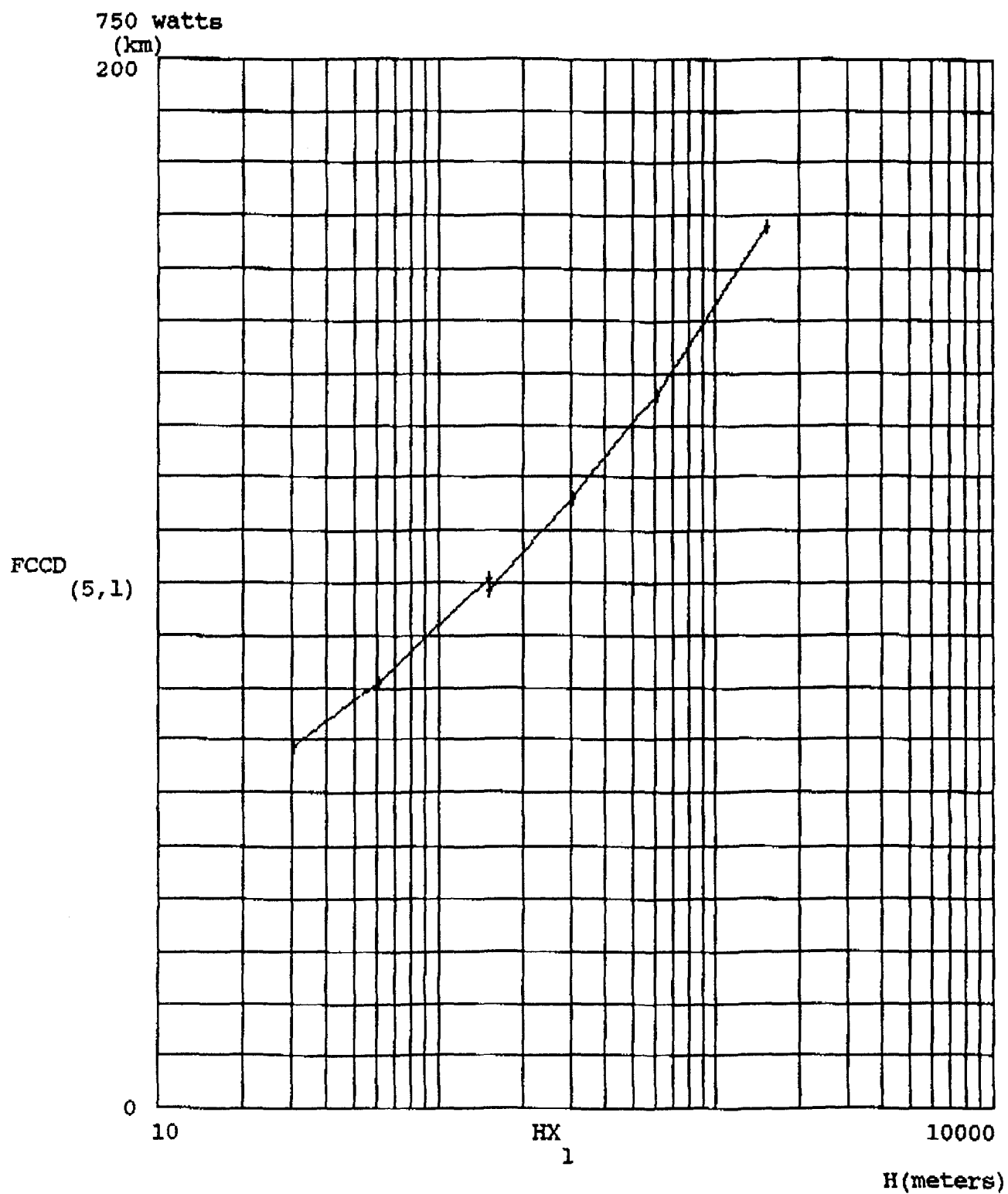


Figure C12(f). Plot of VHF Interference Distance From FCC Equation

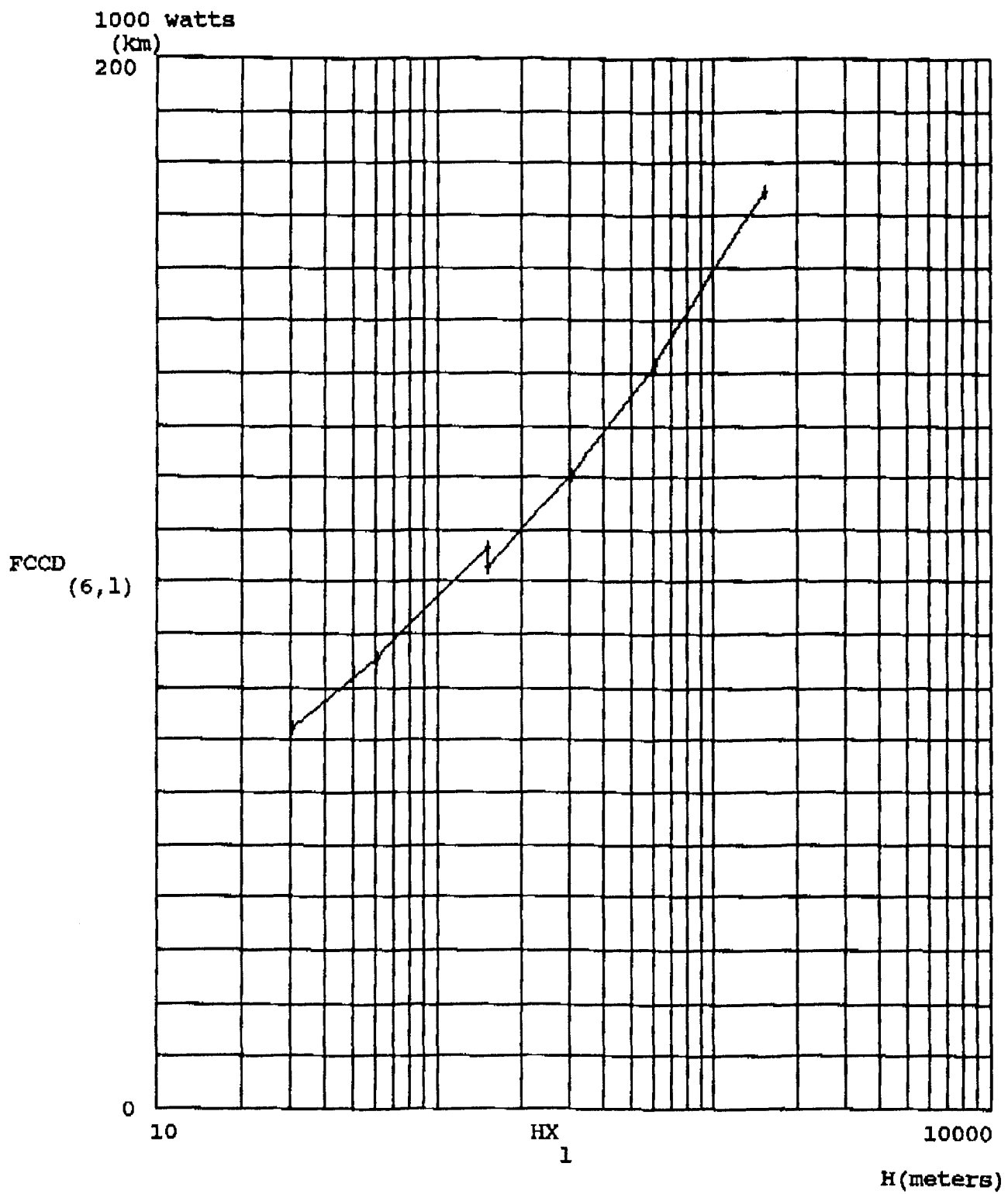


Figure C12(g). Plot of VHF Interference Distance From FCC Equation

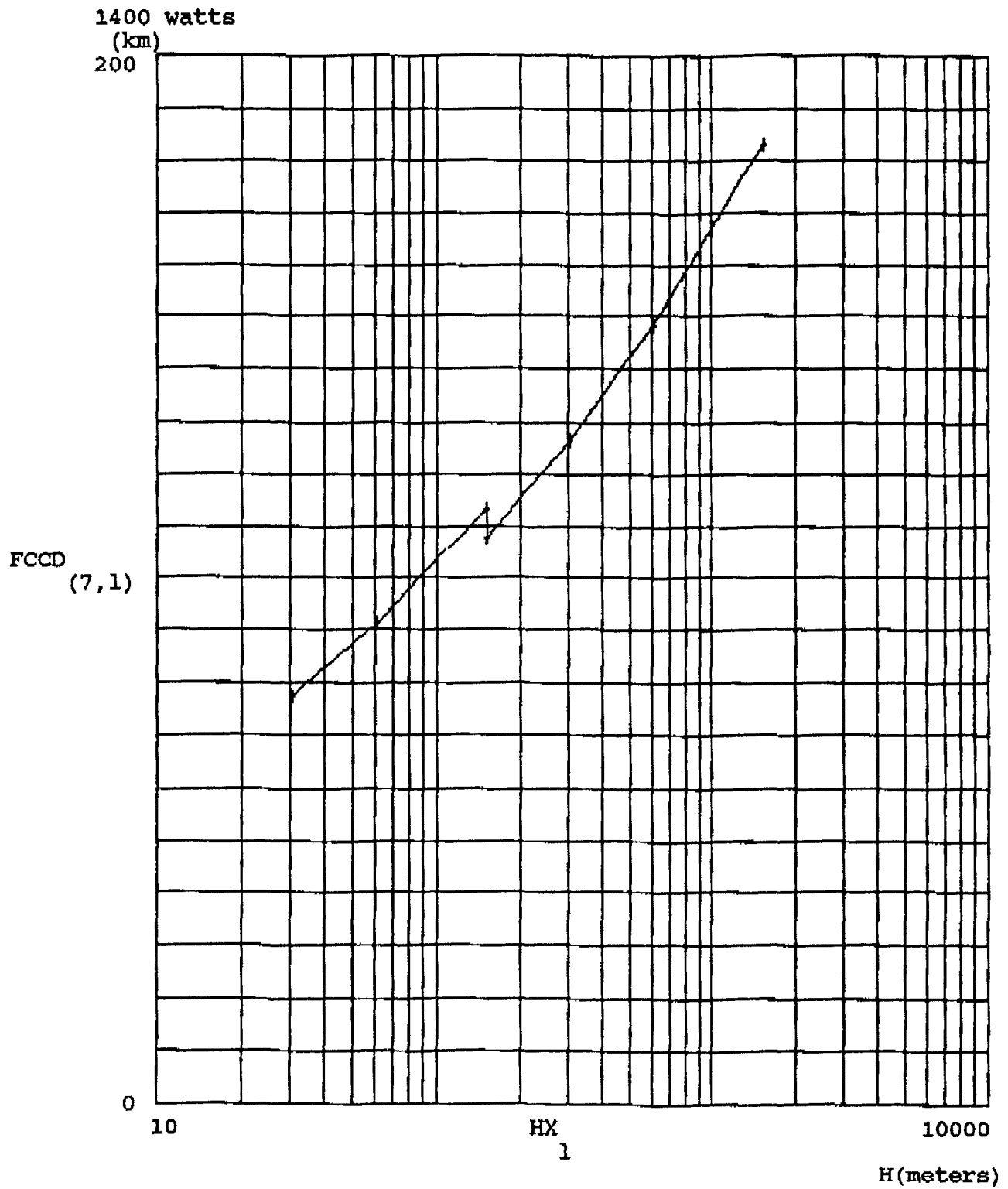


Figure C13. Basic VHF One-Way or Two-Way Mobile Interference Contour Data

Elevations Used: 100, 200, 500, 1000, 2000, 5000 ft.
 30.5, 61.0, 152.4, 304.8, 609.6, 1524 meters

ERP's Used: 50, 100, 250, 500, 750, 1000, 1400 watts

Matrix of Carey Interference Contour Distances (km)
 up to 500' elevation:

Elevation→				
VL =	39.268	50.373	65.5	E R P ↓
	46.188	56.971	73.064	
	57.454	67.914	84.33	
	67.432	77.41	94.308	
	73.869	83.847	100.584	
	78.858	88.675	105.09	
	84.974	94.308	111.206	

Matrix of Carey Interference Contour Distances (km)
 without 3 dB/Octave correction above 500' elevation:

IL =	79.663	93.181	110.884
	87.388	101.872	121.828
	98.492	115.229	136.473
	108.792	126.817	149.186
	115.39	134.22	156.911
	120.54	139.53	162.705
	126.334	146.129	170.269

Matrix of Carey Interference Contour Distances (km)
 with 3 dB/Octave correction about 500' elevation:

IU =	87.388	111.85	149.347
	95.595	122.954	162.705
	108.631	139.53	182.983
	120.54	152.727	197.628
	127.46	160.774	206.801
	133.093	168.499	213.721
	140.174	177.672	222.09

Error Matrix for points up through 500' elevation:

'Formula calculated distance' - 'Carey Interf Contour Distance' (km):

$$ELL = \begin{bmatrix} 4.677 & 0.54 & -3.486 \\ 3.611 & 0.74 & -2.709 \\ 1.297 & 0.196 & -1.203 \\ -0.855 & -0.204 & 0 \\ -2.24 & -0.768 & 0.949 \\ -3.413 & -1.16 & 1.902 \\ -4.807 & -1.303 & 2.545 \end{bmatrix}$$

Standard Deviation of Above Errors: $\sigma = 10.658$ km"

A row by row plot of these errors is presented in Figure C11.

Error Matrix for points aabove 500' elevation:

'Formula calculated distance' - 'Carey Interf w/o correction' (km):

$$ELU = \begin{bmatrix} -6.849 & -6.997 & -0.235 \\ -4.663 & -3.676 & 5.326 \\ -0.565 & 1.451 & 16.335 \\ 2.465 & 6.125 & 26.413 \\ 4.49 & 9.265 & 33.566 \\ 5.861 & 11.938 & 39.086 \\ 8.145 & 15.243 & 45.611 \end{bmatrix}$$

Error Matrix for points above 500' elevation:

'Formula calculated distance' - 'Carey Interf w correction' (km):

$$EUU = \begin{bmatrix} -14.574 & -25.665 & -38.698 \\ -12.87 & -24.758 & -35.552 \\ -10.704 & -22.85 & -30.175 \\ -9.283 & -19.786 & -22.028 \\ -7.58 & -17.289 & -16.324 \\ -6.692 & -17.03 & -11.93 \\ -5.695 & -16.3 & -6.21 \end{bmatrix}$$

Error Matrix for points above 500' elevation:

'Formula calculated distance' - '50/50 Weighted Average of Carey Interf w & w/o Correction' (km):

$$EAU = \begin{bmatrix} -10.712 & -16.331 & -19.466 \\ -8.767 & -14.217 & -15.113 \\ -5.634 & -10.7 & -6.92 \\ -3.409 & -6.831 & 2.192 \\ -1.545 & -4.012 & 8.621 \\ -0.415 & -2.546 & 13.578 \\ 1.225 & -0.529 & 19.7 \end{bmatrix}$$

Error Matrix for all points from proposed equation re
50/50 weighted Average of Carey Interf w & w/o Correction (km):

$$EA = \begin{bmatrix} 4.677 & 0.54 & -3.486 & -10.712 & -16.331 & -19.466 \\ 3.611 & 0.74 & -2.709 & -8.767 & -14.217 & -15.113 \\ 1.297 & 0.196 & -1.203 & -5.634 & -10.7 & -6.92 \\ -0.855 & -0.204 & 0 & -3.409 & -6.831 & 2.192 \\ -2.24 & -0.768 & 0.949 & -1.545 & -4.012 & 8.621 \\ -3.413 & -1.16 & 1.902 & -0.415 & -2.546 & 13.578 \\ -4.807 & -1.303 & 2.545 & 1.225 & -0.529 & 19.7 \end{bmatrix}$$

Standard Deviation of Above Errors: $\sigma A = 46.89$ km

NO ERROR MATRICES HAVE BEEN COMPUTED RE FCC EQUATIONS. Equations
that contain a discontinuity as a function of height are not practical.

Figure D1. Proposed UHF One-Way or Two-Way Mobile Service Contour Formula.

The following formula has been developed for calculating UHF One-Way or Two-Way Mobile Service Contour Distances:

$$d = 2.024 \times h^{(0.331-0.0000021 \times p)} \times p^{(0.171-0.0000034 \times h)}$$

where

d is the radial distance in kilometers

h is the radial antenna HAAT in meters

p is the radial ERP in watts

Figure D2 contains a series of plots of the proposed formula.

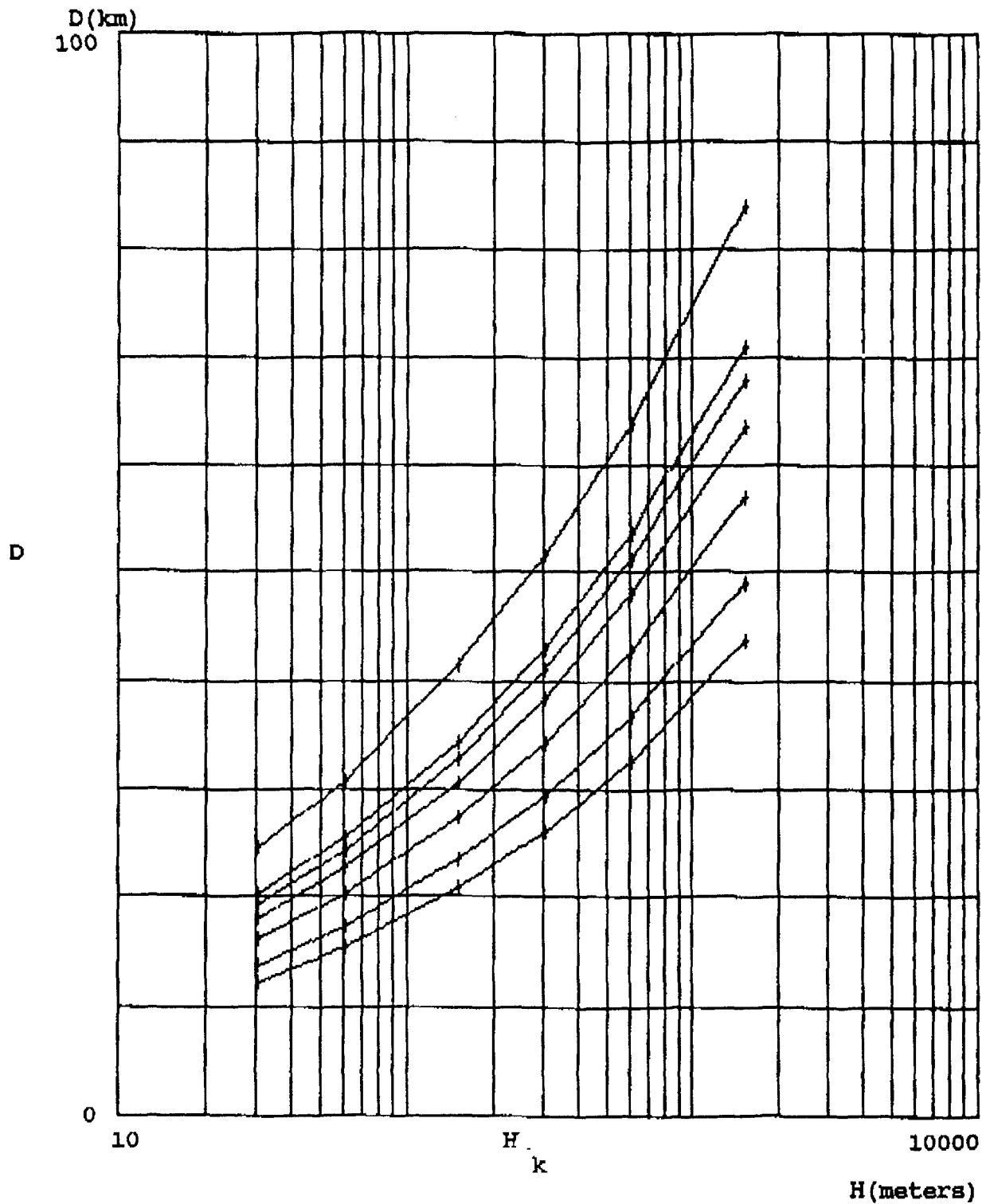
Figure D3 contains a series of plots of the Carey 39 dBu Service Contour Distances for the same points displayed in Figure D2.

Figure D4 contains a series of plots of the differences between the proposed formula results and the Carey Service Contour data.

Figure D5 contains listings of the Carey 39 dBu Service Contour data, errors, and relevant results. Errors for the FCC Proposed equation are also listed. The equation used for these calculations was:

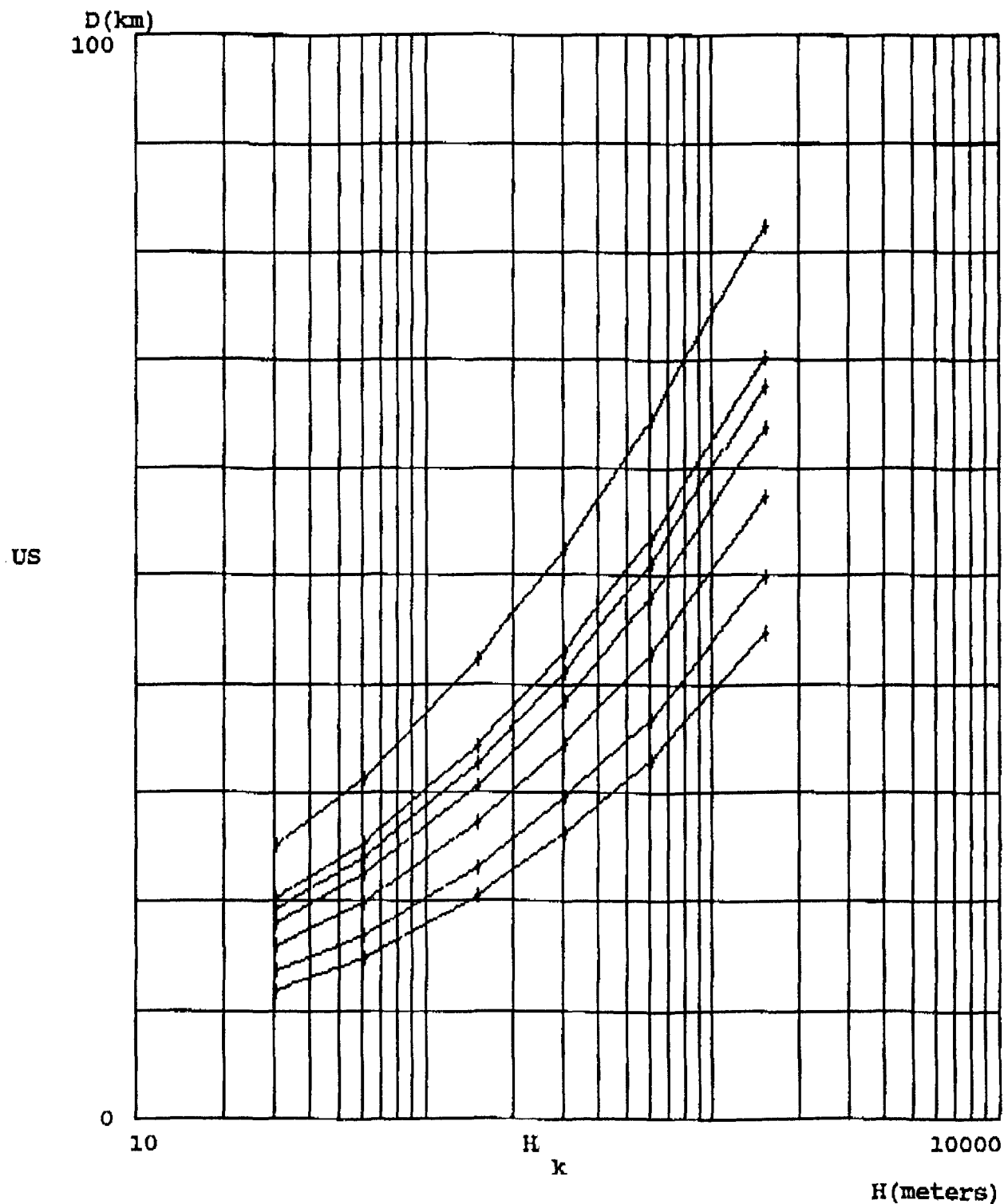
$$d = 1.739 \times h^{0.35} \times p^{0.18}$$

Figure D2. UHF ONE-WAY OR TWO-WAY MOBILE SERVICE CONTOUR DISTANCE



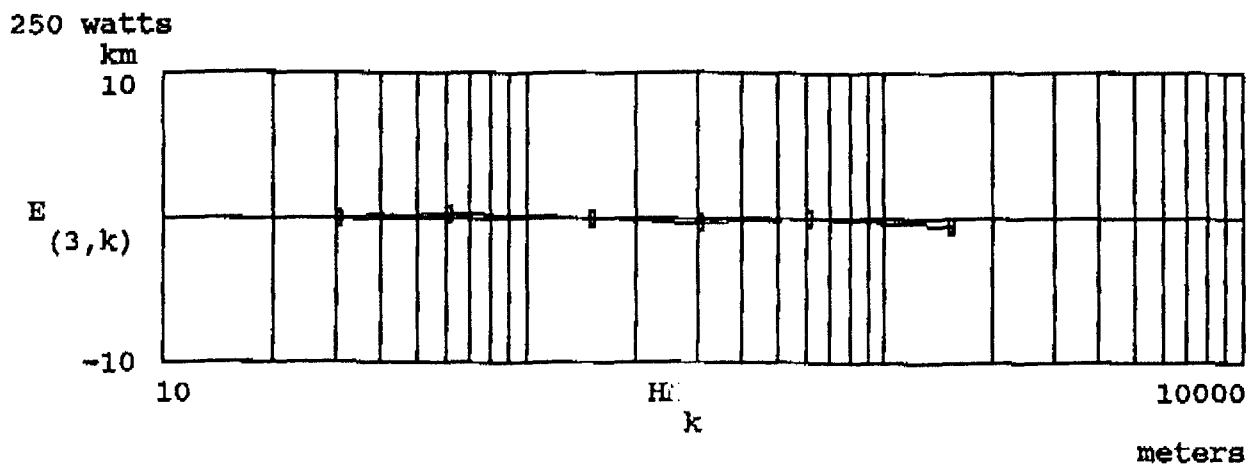
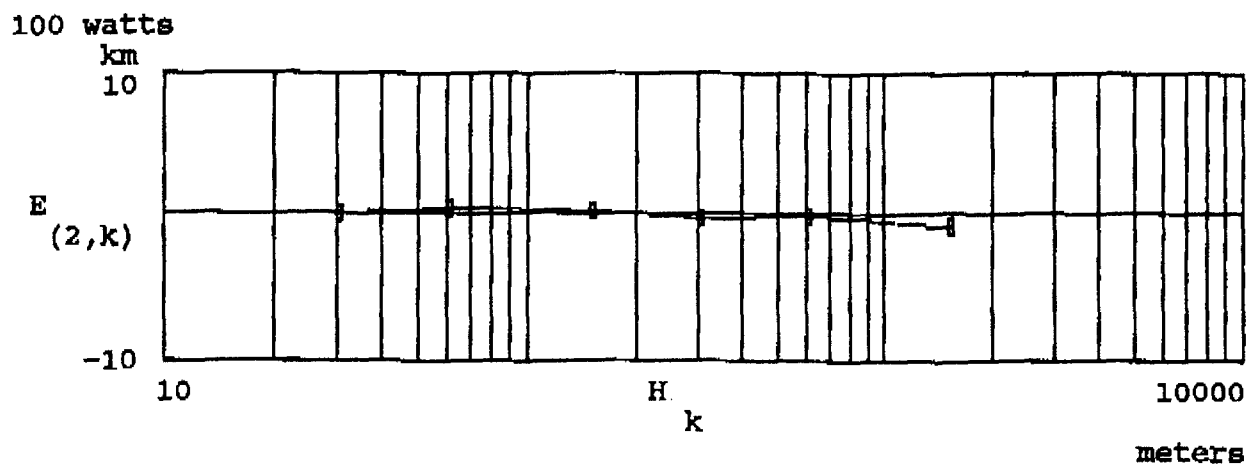
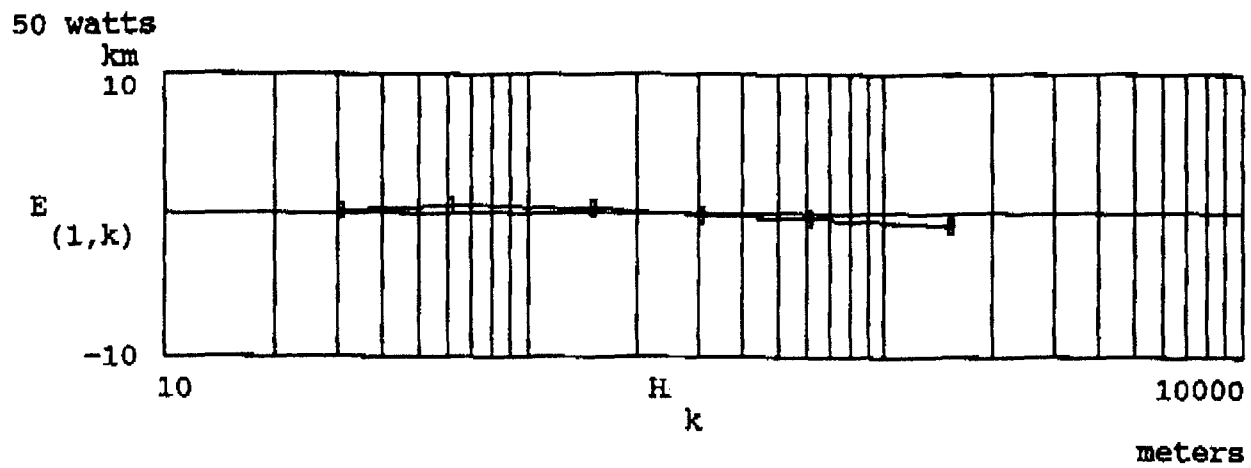
UHF One-Way or Two-Way Mobile Service Contour Distances as calculated from proposed formula as a function of Height for EPS's of 50, 100, 250, 500, 750, 1000, 3500 watts

Figure D3. UHF 39 dBu Service Contour Distances

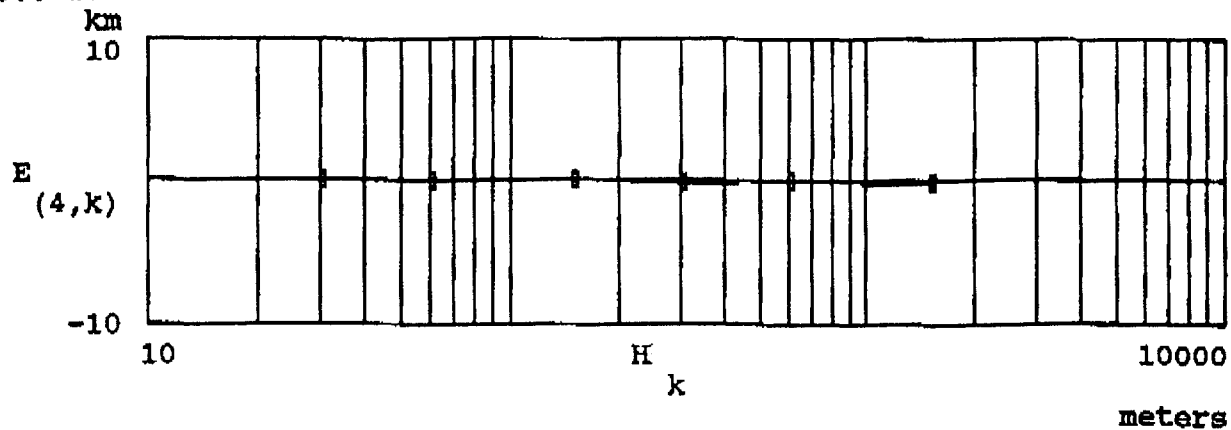


UHF One-Way or Two-Way 39 dBu Service Contour Distances
as a function of Height for ERP's of
50, 100, 250, 500, 750, 1000, 3500 watts.

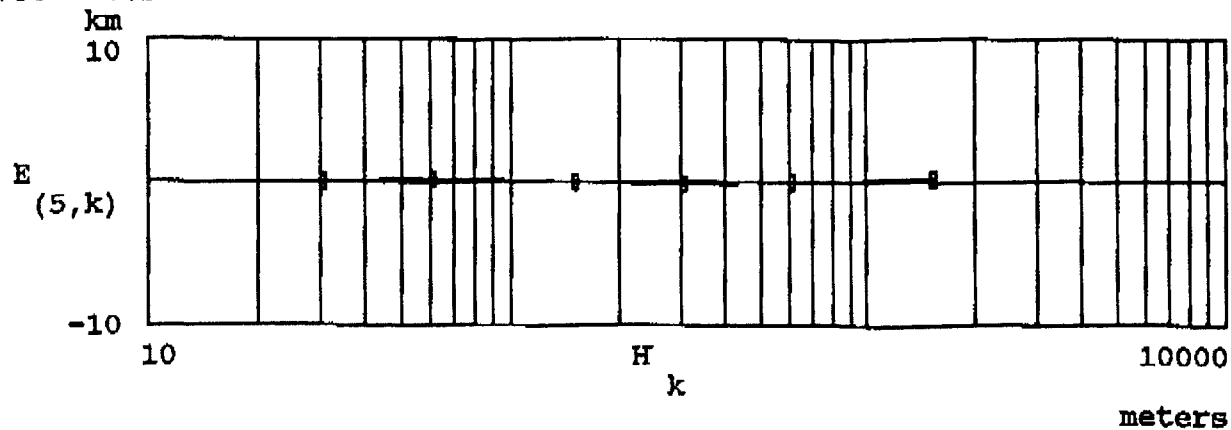
Figure D4. PLOTS of 'Formula Distance' - 'Carey Service Contour Distance'
as a function of height for various ERP's



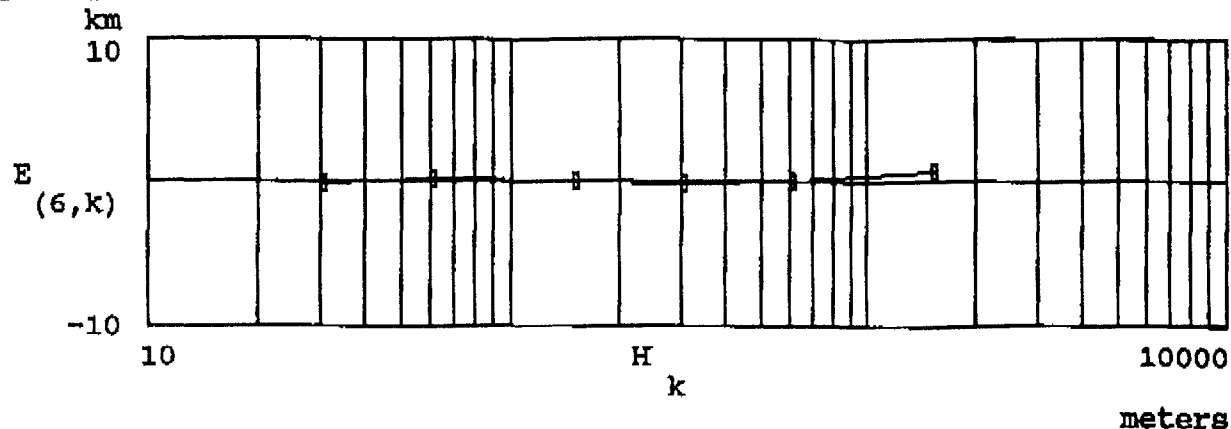
500 watts



750 watts



1000 watts



3500 watts

